

United States of America

DRAFT PROPOSAL FOR THE WORK OF THE CONFERENCE

WRC-07 Agenda Item 1.20¹: to consider the results of studies, and proposals for regulatory measures, if appropriate, regarding the protection of the Earth exploration-satellite service (passive) from unwanted emissions of active services in accordance with Resolution **738 (WRC-03)**;

Background Information: The *resolves* in Resolution **738** calls for three actions: 1) study the compatibility between EESS (passive) and the corresponding active services listed in the Table in Resolution **738** to update Recommendation ITU-R SM.1633 or develop additional Recommendations; 2) further study the impact of implementing the values in *considering f*) and *g*) in the bands 31–31.3 GHz and 51.4–52.6 GHz for unwanted emissions of systems operating in Region 2 and 3, taking into account that the impact on fixed-service systems in Region 1 is documented in ITU-R Recommendation SM.1633; and 3) review the results of studies in 1) and 2) in order to consider regulatory measures, if appropriate, to ensure the protection of the EESS (passive) operating in the bands listed in the table in Resolution **738 (WRC 03)** from unwanted emissions of active services operating in the corresponding bands while taking into account the impact on all concerned services of implementing or not implementing such measures. The table below shows the frequency band and radiocommunication service combinations within the scope of the agenda item.

EESS (passive) band	Active service band	Active service
1 400-1 427 MHz	1 350-1 400 MHz	Fixed service (FS) Mobile service (MS) Radiolocation service (RLS)
	1 427-1 429 MHz	FS, MS (except aeronautical mobile service (AMS)) and space operation service (Earth-to-space) ¹
	1 429-1 452 MHz	FS and MS
23.6-24 GHz	22.55-23.55 GHz	Inter-satellite service (ISS)
31.3-31.5 GHz	30-31 GHz	FSS (Earth-to-space)
	31-31.3 GHz	FS (except HAPS)
50.2-50.4 GHz ²	50.4-51.4 GHz ²	FSS (Earth-to-space) ²
	47.2-50.2 GHz (Regions 2 and 3) 49.44-50.2 GHz ² (Region 1)	FSS ²
52.6-54.25 GHz	51.4-52.6 GHz	FS

¹ Resolution 738 (WRC 03) incorrectly refers to the space research service instead of the space operation service.

² Studies in this band must take into account No. **5.340.1**.

¹ This ~~is a counter~~ proposal ~~supercedeste~~ the one contained in FCC Public Notice DA 05-1011 as WAC/052(04.04.05).

Studies documented in Recommendation ITU-R SM.1633 show that active services in some of these bands do not produce significant unwanted emissions in the adjacent passive band. However, active services in other bands produce or theoretically could produce unwanted emissions in excess of EESS (passive) protection criteria in ITU-R recommendations, requirements. Because of the differences between the active services, and the differences in the use of the active and passive services from band to band, the solutions for this agenda item have been determined on a band-by-band and service-by-service basis. [The proposed solutions were determined considering the impact to both the active and passive services.]

Resolution 738 can be suppressed, and there is no need for an agenda item dealing with unwanted emission levels in EESS (passive) bands for the next Conference.

Proposal:

USA/ /1 MOD

1 300-1 525 MHz

Allocation to services		
Region 1	Region 2	Region 3
.....		
1 350-1 400 FIXED <u>ADD 5.AAA</u> MOBILE RADIOLOCATION 5.149 5.338 5.339 5.339A	1 350-1 400 RADIOLOCATION 5.149 5.334 5.339 5.339A	
1 400-1 427	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340 5.341	
1 427-1 429	SPACE OPERATION (Earth-to-space) <u>ADD 5.BBB</u> FIXED <u>ADD 5.AAA</u> MOBILE except aeronautical mobile 5.341	
1 429-1 452 FIXED <u>ADD 5.AAA</u> MOBILE except aeronautical mobile 5.339A 5.341 5.342	1 429-1 452 FIXED <u>ADD 5.AAA</u> MOBILE 5.343 5.339A 5.341	
.....		

USA/ /2 ADD

5.AAA Fixed Service stations brought into use after [last day of WRC-07] should take reasonable steps to restrict~~In order to ensure the protection of the Earth exploration satellite (passive) service in the band 1 400–1 427 MHz,~~ the unwanted emissions power delivered to the antenna of any station in the fixed service operating in the band 1 350–1 400 MHz or in the band 1 427–1 452 MHz to the level of [shall be limited to –45 dBW in the 27 MHz reference bandwidth] of the Earth Exploration Satellite (passive) Service in the band 1 400-1427 MHz.~~400–1 427 MHz. Fixed service systems in operation at the date of entry into force of the Final Acts of WRC-07 are not subject to this limit.~~

Reasons: Results of studies documented in Recommendation ITU–R SM.1633 show that large numbers of higher power fixed service transmitters can cause significant levels of unwanted emissions in the 1 400–1 427 MHz passive band. [Considering equitable burden-sharing between the active and passive services], the single-entry unwanted emission limit proposed for future systems will slightly exceed the desired protection level of the EESS (passive) sensors in some cases, but will still allow the collection of valuable scientific data and will not place an undue burden on the future development and use of the fixed service in these nearby bands. The level of regulatory protection of the EESS (passive) from harmful interference that may be caused by the unwanted emissions of active services is provided by No. 4.7

USA/ /3 NOC

No change to Radio Regulations regarding the radiolocation service allocation in the band 1 350–1 400 MHz.

Reasons: Although studies documented in Recommendation ITU–R SM.1633 show that the radiolocation unwanted emissions in the EESS (passive) band at 1 400–1 427 MHz would exceed the permissible interference threshold in Recommendation ITU–R SA.1029–2, any interference would occur for only short time periods and would be readily discernible by users of the remote sensing data, allowing corrupted data to be discarded. The remaining uncorrupted data is expected to satisfy the scientific objectives of the EESS missions. Studies also show that radars would experience unacceptable degradation in operational coverage and range, target resolution, and accuracy if required to meet unwanted emission limits in the 1 400–1 427 MHz band. As with other pairs of active and passive bands, use of portions of the allocated bands must not be restricted. Radars would suffer an increased likelihood of interference from other radars and a reduction in coverage range, while a reduced bandwidth would be inadequate for remote sensing requirements.

USA/ /4 ADD

5.BBB Space Operations Service earth stations brought into use after [last day of WRC-07] should take reasonable steps to restrict ~~In order to ensure the protection of the Earth exploration satellite (passive) service in the band 1 400–1 427 MHz,~~ the unwanted emissions e.i.r.p. of any earth station in the space operation service (Earth-to-space) operating in the band 1 427–1 429 MHz shall be limited to the level of 8 dBW in the 27 MHz reference bandwidth of the Earth Exploration-Satellite (passive) Service band 1 400–1 427 MHz. ~~Space operation service earth stations in operation at the date of entry into force of the Final Acts of WRC-07 are not subject to this limit.~~

Reasons: Results of studies documented in Recommendation ITU–R SM.1633 show that earth station transmitters in the 1 427–1 429 MHz band can cause significant levels of unwanted emissions in the 1 400–1 427 MHz passive band. [Considering equitable burden-sharing between the active and passive services], the single-entry unwanted emission limit proposed for future systems will slightly exceed the desired protection level of the EESS (passive) sensors in some cases, but will still allow the collection of valuable scientific data and will not place an undue burden on the future development and use of the space operation service (Earth-to-space) in the 1 427–1 429 MHz band. The level of regulatory protection of the EESS (passive) from harmful interference that may be caused by the unwanted emissions of active services is provided by No. 4.7

22-24.75 GHz

Allocation to services		
Region 1	Region 2	Region 3
....		
22.55-23.55	FIXED INTER-SATELLITE MOBILE 5.149	
23.55-23.6	FIXED MOBILE	
23.6-24	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
....		

USA/ /5 NOC

No change to Radio Regulations regarding the inter-satellite service allocation in the band 22.55–23.55 GHz.

Reasons: Results of studies documented in Recommendation ITU–R SM.1633 show that unwanted emissions from the ISS in the 22.55–23.55 GHz band are well below the recommended protection criteria for the EESS (passive) in the 23.6–24.0 GHz band. Therefore, no changes are needed to the Radio Regulations to protect the EESS (passive) in the 23.6–24.0 GHz band from unwanted emissions from the ISS in the 22.55–23.55 GHz band.

USA/ /6 MOD

29.9-34.2 GHz

Allocation to services		
Region 1	Region 2	Region 3
....		
30-31	FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Standard frequency and time signal-satellite (space-to-Earth) 5.542	
31-31.3	FIXED 5.543A <u>ADD 5.CCC</u> MOBILE Standard frequency and time signal-satellite (space-to-Earth) Space research 5.544 5.545 5.149	
31.3-31.5	EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) 5.340	
....		

USA/ /7 NOC

No change to Radio Regulations regarding the fixed-satellite service (Earth-to-space) allocation in the band 30-31 GHz.

Reasons: Results of studies documented in Recommendation ITU-R SM.1633 show that unwanted emissions from the FSS in the 30-31 GHz band do not exceed the recommended protection criteria for the EESS (passive) in the 31.3-31.5 GHz band. The FSS allocation is separated from the EESS (passive) allocation by 300 MHz, which greatly reduces the possibility of FSS unwanted emissions exceeding the protection criteria in the EESS (passive) band. Unwanted emission limits in the EESS (passive) band are unnecessary, and could constrain the future development of FSS uplink transmitters in the 30-31 GHz band.

USA/ /8 ADD

5.CCC ~~Fixed Service stations brought into use after [last day of WRC-07] should take reasonable steps to restrict~~~~In order to ensure the protection of the Earth exploration-satellite (passive) service in the band 31.3–31.5 GHz,~~ the unwanted emissions power delivered to the antenna of any station in the fixed service operating in the band 31.0–31.3 GHz to the level of shall be limited to ~~–38 dBW]~~ –38 dBW] in any 100 MHz reference bandwidth ~~of~~ in the Earth Exploration-Satellite (passive) Service in the band 31.3–31.5 GHz (see also No. **5.543A**). ~~Fixed service systems in operation at the date of entry into force of the Final Acts of WRC-07 are not subject to this limit.~~

Reasons: Studies documented in Recommendation ITU–R SM.1633 indicate that EESS (passive) systems in the 31.3–31.5 GHz band are protected if unwanted emissions in that band from fixed service transmitters in the 31.0–31.3 GHz band do not exceed –38 dBW in any 100 MHz reference bandwidth. Measures to ensure that future FS systems in the 31.0–31.3 GHz band do not exceed this level will not constitute an undue burden on the fixed service. The level of regulatory protection of the EESS (passive) fro harmful intefernce that may be caused by emissions from actives services is provided by No. 4.7

USA/ /9 MOD

40-47.5 GHz

Allocation to services		
Region 1	Region 2	Region 3
....		
47.2-47.5	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 <u>ADD 5.DDD</u> MOBILE 5.552A	

47.5-51.4 GHz

Allocation to services		
Region 1	Region 2	Region 3
47.5-47.9 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 <u>ADD 5.DDD</u> (space-to-Earth) 5.516B 5.554A MOBILE	47.5-47.9 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 <u>ADD 5.DDD</u> MOBILE	
47.9-48.2	FIXED FIXED-SATELLITE (Earth-to-space) 5.552 <u>ADD 5.DDD</u> MOBILE 5.552A	
48.2-48.54 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 <u>ADD 5.DDD</u> (space-to-Earth) 5.516B 5.554A 5.555B MOBILE	48.2-50.2 FIXED FIXED-SATELLITE (Earth-to-space) 5.516B 5.552 <u>ADD 5.DDD</u> MOBILE	
48.54-49.44 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 <u>ADD 5.DDD</u> MOBILE 5.149 5.340 5.555		
49.44-50.2 FIXED FIXED-SATELLITE (Earth-to-space) 5.552 <u>ADD 5.DDD</u> (space-to-Earth) 5.516B 5.554A 5.555B MOBILE	5.149 5.340 5.555	
50.2-50.4	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340	
50.4-51.4	FIXED FIXED-SATELLITE (Earth-to-space) <u>ADD 5.DDD</u> MOBILE Mobile-satellite (Earth-to-space)	

USA/ /10 ADD

5.DDD ~~Fixed Satellite Service earth stations brought into use after [last day of WRC-07] should take reasonable steps to restrict~~~~In order to ensure the protection of the Earth exploration-satellite (passive) service in the band 50.2-50.4 GHz,~~ the unwanted emissions e.i.r.p. of any earth station in the fixed-satellite service operating in the band 47.2-50.2 GHz in Regions 2 and 3, 49.44-50.2 GHz in Region 1, and 50.4-51.4 GHz in all Regions ~~to the level~~~~shall be limited of~~to [30 dBW] in the 200 MHz reference bandwidth of the Earth Exploration (passive) Service in the band 50.2-50.4 GHz in clear sky conditions, and to a level that is Y dB higher during fading conditions. ~~Fixed-satellite service systems in operation at the date of entry into force of the Final Acts of WRC-07 are not subject to this limit.~~

Reasons: Results of studies documented in Recommendation ITU-R SM.1633 show that fixed-satellite service uplink transmitters operating in bands adjacent to then 50.2-50.4 GHz passive band can cause significant levels of unwanted emissions in the 50.2-50.4 GHz passive band. The level of regulatory protection of the EESS (passive) from harmful interference that may be caused by the unwanted emissions of active services is provided by No. 4.7.

USA/ /11 MOD

51.4-55.78 GHz

Allocation to services		
Region 1	Region 2	Region 3
51.4-52.6	FIXED <u>ADD 5.EEE</u> MOBILE 5.547 5.556	
52.6-54.25	EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) 5.340 5.556	
....		

USA/ /12 ADD

5.EEE ~~Fixed Service stations brought into use after [last day of WRC-07] should take reasonable steps to restrict~~~~In order to ensure the protection of the Earth exploration-satellite (passive) service in the band 52.6-54.25 GHz,~~ the unwanted emissions power delivered to the antenna of any station in the fixed service operating in the band 51.4-52.6 GHz ~~to the level of~~~~shall be limited to~~ [-33 dBW] in any 100 MHz reference bandwidth ~~of~~in the Earth Exploration (passive) Service in the band 52.6-54.25 GHz. ~~Fixed-service systems in operation at the date of entry into force of the Final Acts of WRC-07 are not subject to this limit.~~

Reasons: Studies documented in Recommendation ITU-R SM.1633 indicate that EESS (passive) systems in the 52.6-54.25 GHz band are protected if unwanted emissions in that band from fixed service transmitters in the 51.4-52.6 GHz band do not exceed -33 dBW in any 100 MHz reference bandwidth. Measures to ensure that future FS systems in the 51.4-52.6 GHz

band do not exceed this level will not constitute an undue burden on the fixed service. The level of regulatory protection of the EESS (passive) from harmful interference that may be caused by the unwanted emissions of active services is provided by No. 4.7

USA/ /13 SUP

RESOLUTION 738 (WRC-03)

Compatibility analyses between the Earth exploration-satellite service (passive) and active services

Reasons: Consequential to completion of this agenda item. All of the actions required under this Resolution will have been completed at WRC-07 and it may be suppressed. The technical studies will either have confirmed that the unwanted emissions do not interfere with the EESS (passive) or appropriate regulatory measures, if necessary, will have been determined and decided by WRC-07.
